

CLAIMS:

1. A method (60) for controlling multiple tasks (114, 115; 174,175) comprising:
assigning (61) a first task to be a More Important Task (114, 174);
5 assigning (62) a second task to be a Less Important Task (115; 175);
allocating (63) a Guaranteed Budget Margin to the More Important Task (114; 174)
along with a More Important Guaranteed Budget and explicitly informing the More Important
Task of this allocation;
allocating (64) a Less Important Guaranteed Budget to the Less Important Task (115;
10 175) and explicitly informing the Less Important Task about this allocation;
sending (67) a message that the More Important Task (114; 174) no longer requires the
Guaranteed Budget Margin; and
allocating (68) a Conditionally Guaranteed Budget Margin to the Less Important Task
(115; 175) and explicitly informing the Less Important Task of this allocation.

15 2. The method according to claim 1, further comprising determining (66) that the
More Important Task (114; 174) no longer requires the Guaranteed Budget Margin.

3. A method (60; 90; 150) for operating a first task (114; 174), which first task (114;
20 174) has been assigned a higher level of priority than a second task (115; 175) comprising:
determining (66; 69; 93; 97; 153; 157) whether the first task (114; 174) requires
additional budget margin; and
sending a message that either the additional budget margin is no longer required (67;
94; 154) or that the additional budget margin is now required (691; 98; 158).

25 4. The method according to claim 3, further comprising allocating (68) a conditionally
guaranteed budget margin automatically to the second task (115; 175) upon receiving the
message that the first task (114; 174) no longer requires the additional budget margin.

5. A method (70; 190) for controlling two or more tasks (114, 115; 174, 175) of a multi-task process comprising:

explicitly informing (73; 183) a first task (114; 174) that is a more important task about a More Important Guaranteed Budget and a Guaranteed Budget Margin;

5 explicitly informing (74; 184) a second task (115; 175) that is a less important task about a Less Important Guaranteed Budget and a Conditionally Guaranteed Budget Margin;

providing (82; 186) the More Important Guaranteed Budget plus the Guaranteed Budget Margin to the first task (114; 174) at a first possible occasion;

10 providing (82; 187) the Less Important Guaranteed Budget to the second task (115; 175) at a first possible occasion;

upon the first task (114; 174) determining (93; 188) at some point during execution that the first task (114; 174) can do its job with the More Important Guaranteed Budget only, explicitly informing (94; 188) a scheduler (113; 173) that the first task (114; 174) does not require its Guaranteed Budget Margin.

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6. The method according to claim 5, further comprising:

stopping (189) to provide the Guaranteed Budget Margin to the first task (114; 174) at a first possible occasion.

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7. The method according to claim 6, further comprising:

starting (190) to provide the Conditionally Guaranteed Budget Margin to the second task (115; 175) at a first possible occasion.

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8. The method according to claim 7, further comprising:

informing (191) the second task (115; 175) of the providing the Conditionally Guaranteed Budget Margin.

9. The method according to claim 7, further comprising:

determining (192) by the first task (114; 174) at some point during execution that the first task (114; 174) requires the Guaranteed Budget Margin.

10. The method according to claim 9, further comprising:

5 explicitly informing (192) the scheduler (113; 173) that the first task (114; 174) does require its Guaranteed Budget Margin.

11. The method according to claim 10, further comprising:

10 informing (193) the second task (115; 175) that the Conditionally Guaranteed Budget Margin will be withdrawn.

12. The method according to claim 11, further comprising:

15 stopping (194) to provide the Conditionally Guaranteed Budget Margin to the second task (115; 175) at a first possible occasion.

13. The method according to claim 11, further comprising:

starting (195) to provide the Guaranteed Budget Margin to the first task (114; 174) at a first possible occasion.

20 14. An apparatus (110) comprising:

a first task (114) having a first priority level;

a second task (115) having a second priority level lower than the first priority level;

an allocation mechanism (112) to allocate budgets of resources, said allocation

25 mechanism (112) explicitly informing the first (114) task about a More Important Guaranteed Budget and a Guaranteed Budget Margin and explicitly informing the second task (115) about a Less Important Guaranteed Budget and a Conditionally Guaranteed Budget Margin; and

a scheduler (113) providing the budgeted amounts to the first and second tasks (114, 115), said scheduler (113) providing the More Important Guaranteed Budget plus the Guaranteed Budget Margin to the first task (114) at a first possible occasion and providing the

Less Important Guaranteed Budget to the second task (115) at a first possible occasion, wherein upon the first task (114) determining at some point during execution that the first task (114) can execute properly with the More Important Guaranteed Budget only, said first task (114) explicitly informing the scheduler (113) that the first task (114) does not require its
5 Guaranteed Budget Margin.

15. The apparatus according to claim 14, wherein the scheduler (113) stops providing the Guaranteed Budget Margin to the first task (114) at a first possible occasion and starts providing the Conditionally Guaranteed Budget Margin to the second task (115) at a first
10 possible occasion.

16. The apparatus according to claim 15, wherein the scheduler (113) informs the second task (115) of the providing the Conditionally Guaranteed Budget Margin.

15 17. The apparatus according to claim 14, wherein the first task (114) determines at some point during execution that the first task requires the Guaranteed Budget Margin as well and the first task explicitly informs the scheduler (113) that the first task (114) does require its Guaranteed Budget Margin.

20 18. The apparatus according to claim 17, wherein the scheduler (113) informs the second task (115) that the Conditionally Guaranteed Budget Margin will be withdrawn.

19. The apparatus according to claim 18, wherein the scheduler (113) stops providing the Conditionally Guaranteed Budget Margin to the second task (115) at a first possible
25 occasion.

20. The apparatus according to claim 19, wherein the scheduler (113) starts providing the Guaranteed Budget Margin to the first task (114) at a first possible occasion.

21. An apparatus (170) comprising:

a first task (174) having a first priority level;

a second task (175) having a second priority level lower than the first priority level;

an allocation mechanism (172) to allocate budgets of resources, said first task being

5 explicitly informed about a More Important Guaranteed Budget and a Guaranteed Budget Margin and said second task being explicitly informing about a Less Important Guaranteed Budget and a Conditionally Guaranteed Budget Margin;

a conditional budget monitor (176) to monitor an availability of the Conditionally Guaranteed Budget Margin, said conditional budget monitor to receive a message that the
10 More Important Task (174) no longer requires the Guaranteed Budget Margin, to receive a message that the More Important Task (174) now requires the Guaranteed Budget Margin, to receive budget allocations of the Guaranteed Budget Margin, the Conditionally Guaranteed Budget Margin, the More Important Guaranteed Budget and the Less Important Guaranteed Budget from the allocation mechanism (172), and to send out a reservation command
15 regarding the budget allocations; and

a scheduler (173) providing the budgeted amounts to the first and second tasks (174, 175) based on the reservation command, said scheduler (173) providing the More Important Guaranteed Budget plus the Guaranteed Budget Margin to the first task (174) at a first possible occasion and providing the Less Important Guaranteed Budget to the second task (175) at a
20 first possible occasion, wherein upon the first task (174) determining at some point during execution that the first task (174) can execute properly with the More Important Guaranteed Budget only, said conditional budget monitor (176) sending a reservation command to the scheduler (173) including only the More Important Guaranteed Budget for the first task (174) and including the Conditionally Guaranteed Budget Margin along with the Less Important
25 Guaranteed Budget for the second task (175).

22. The apparatus according to claim 21, wherein upon the first task determining that is now requires the Guaranteed Budget Margin, and communicating this to the conditional budget monitor, the conditional budget monitor (176) sending a reservation command to the

scheduler (173) including the Guaranteed Budget Margin and the More Important Guaranteed Budget to the first task (174) and the Less Important Guaranteed Budget only to the second task (175).

5 23. The apparatus according to claim 21, wherein the conditional budget monitor (173) informs the second task (175) of the providing the Conditionally Guaranteed Budget Margin.

10 24. The apparatus according to claim 22, wherein the conditional budget monitor (173) informs the second task (175) that the Conditionally Guaranteed Budget Margin will be withdrawn.